

# Claims

- [c1] A method for setting the grid voltage of a tandem pin charging device, the method comprising:
- determining a charge-generating emitter ratio of a first charging unit;
  - setting a first grid voltage based on the charge-generating emitter ratio of the first charging unit;
  - determining a charge-generating emitter ratio of a second charging unit;
  - setting a second grid voltage based on the determined charge-generating emitter ratio of the second charging unit; and
  - comparing a final voltage of a photoreceptor with a final target voltage.
- [c2] The method of claim 1, wherein determining the charge-generating emitter ratio of the first charging unit comprises:
- determining a target voltage of a first charging unit grid;
  - determining a target voltage of a second charging unit grid;
  - measuring at least one environmental parameter;
  - setting a voltage of the first charging unit grid to an

amount below the target voltage of the first charging unit grid;  
setting the second charging unit grid to a minimum amount;  
sensing a first photoreceptor voltage;  
setting the first charging unit to an amount above the target voltage of the first charging unit;  
setting the second charging unit grid to the minimum amount; and  
sensing a second photoreceptor voltage.

- [c3] The method of claim 2, further comprising charging the first charging unit grid and the second charging unit grid by a pin scorotron device.
- [c4] The method of claim 2, further comprising charging the first charging unit grid and the second charging unit grid by a pin corotron device.
- [c5] The method of claim 2, further comprising determining the target voltage of the first charging to be about five hundred volts.
- [c6] The method of claim 1, wherein determining the charge-generating emitter ratio of the second charging unit comprises:  
setting the first charging unit voltage to a setback target

voltage;  
setting the second charging unit voltage to a first amount below the final target voltage;  
sensing a third photoreceptor voltage;  
setting the second charging unit voltage to a second amount below the final target voltage;  
sensing a forth photoreceptor voltage.

[c7] The method of claim 1, further comprising adjusting the second charging unit voltage to one of a higher voltage and a lower voltage when the final voltage of the photoreceptor is not within a predetermined range of the target voltage.

[c8] The method of claim 7, further comprising counting a number of voltage adjustments with a loop counter and indicating a fault when the number of voltage adjustments reaches a predetermined amount.

[c9] The method of claim 7, further comprising making no adjustment to the second charging unit voltage when the final voltage is within the predetermined range of the target voltage.

[c10] The method of claim 7, further comprising adjusting the offset voltage in increments of about five volts.

[c11] The method of claim 7, further comprising determining

that the predetermined range is one of about ten volts above the target voltage and about ten volts below the target voltage.

- [c12] The method of claim 8, further comprising indicating a fault when the loop counter counts ten voltage adjustments.
- [c13] The method of claim 1, further comprising determining the final target voltage to be about six hundred and fifty volts.
- [c14] The method of claim 1, further comprising measuring the final voltage of the photoreceptor with an electrostatic volt meter.
- [c15] A charging system control system that controls the grid voltage set-up process of a tandem pin charging device, comprising:
  - a first charging unit target voltage determining circuit, routine or application that determines the target voltage for a first charging unit;
  - a second charging unit target voltage determining circuit, routine or application that determines the target voltage of a second charging unit;
  - a charge-generating emitter ratio determining circuit, routine or application that determines the charge-

generating emitter ratio of at least one of the first charging unit and the second charging unit; and  
a final voltage comparing circuit, routine or application that compares a final voltage applied to a photoreceptor with a final target voltage.

[c16] The charging system control system of claim 15, further comprising an input/output interface for inputting data from at least one of an electronic volt meter and an environmental data source to at least one of a memory, a first charging unit target voltage determining circuit, routine or application, a second charging unit target voltage determining circuit, routine or application, a charge generating emitter determining circuit, routine or application and a final voltage comparing circuit routine or application.

[c17] The charging system control system of claim 15, further comprising a controller for controlling at least one of the first charging unit voltage setting device and the second charging unit voltage setting device.

[c18] The charging system control system of claim 17, wherein the input/output interface outputs commands from the controller to at least one of a first charging unit voltage setting device and a second charging unit voltage setting device.

[c19] The charging system control system of claim 15, further comprising a memory for storing data from at least one of the electronic volt meter and the environmental data source.

[c20] The charging system control system of claim 18, wherein the memory is a nonvolatile memory.